

CLAIMS

I/We claim:

- [c1] 1. A light collector for an LED array, comprising a transparent main body having a first portion and a second portion opposite to each other, said first portion having at least one first semi-cylinder and said second portion having a plurality of second semi-cylinders, said first semi-cylinders being perpendicular to said second semi-cylinders; wherein the number and the respective geometric arrangement of said first semi-cylinders and said second semi-cylinders are determined according to the LED array.
- [c2] 2. The light collector of claim 1, wherein said first portion has one first semi-cylinder and said second portion has a plurality of said second semi-cylinders arranged in a linear array.
- [c3] 3. The light collector of claim 2, wherein said second portion has three said second semi-cylinders.
- [c4] 4. The light collector of claim 1, wherein said first portion has a pair of first semi-cylinders parallelly arranged together and said second portion has a plurality of said second semi-cylinders arranged in a two-dimensional array.
- [c5] 5. The light collector of claim 4, wherein said second portion has four said second semi-cylinders.
- [c6] 6. The light collector of claim 1, wherein said first portion has a pair of said first semi-cylinders parallelly arranged together and said second portion has at least three said second semi-cylinders arranged in a triangular geometry.

- [c7] 7. The light collector of claim 1, wherein the curvature of said first semi-cylinder is selected from a group consisting of spherical curvature and non-spherical curvature.
- [c8] 8. The light collector of claim 1, wherein the curvature of said second semi-cylinder is selected from a group consisting of spherical curvature and non-spherical curvature.
- [c9] 9. The light collector of claim 1, wherein said transparent main body is formed of a material selected from a group consisting of glass, polymethyl methacrylate (PMMA), polycarbonate, acrylic resin, epoxy, urethane and styrene.
- [c10] 10. An illuminating device, comprising:
an LED array including a plurality of light emitting diodes; and
a light collector positioned in front of said LED array, said light collector including a transparent main body having a first portion and a second portion opposite to each other and said second portion facing to said LED array, said first portion having at least one first semi-cylinder and said second portion having a plurality of second semi-cylinders, said first semi-cylinders being perpendicular to said second semi-cylinders;
wherein the number and the respective geometric arrangement of said first semi-cylinders and said second semi-cylinders are determined according to the LED array and said light emitting diodes correspond to said second semi-cylinders in a one-to-one basis.
- [c11] 11. The illuminating device of claim 10, wherein said first portion has one first semi-cylinder and said second portion has a plurality of said second semi-cylinders arranged in a linear array.

- [c12] 12. The illuminating device of claim 11, wherein said second portion has three said second semi-cylinders.
- [c13] 13. The illuminating device of claim 10, wherein said first portion has a pair of first semi-cylinders parallelly arranged together and said second portion has a plurality of said second semi-cylinders arranged in a two-dimensional array.
- [c14] 14. The illuminating device of claim 13, wherein said second portion has four said second semi-cylinders.
- [c15] 15. The illuminating device of claim 10, wherein said first portion has a pair of said first semi-cylinders parallelly arranged together and said second portion has at least three said second semi-cylinders arranged in a triangular geometry.
- [c16] 16. The illuminating device of claim 10, wherein the curvature of said first semi-cylinders is selected from a group consisting of spherical curvature and non-spherical curvature.
- [c17] 17. The illuminating device of claim 10, wherein the curvature of said second semi-cylinders is selected from a group consisting of spherical curvature and non-spherical curvature.
- [c18] 18. The illuminating device of claim 10, wherein said transparent main body is formed of a material selected from a group consisting of glass, polymethyl methacrylate (PMMA), polycarbonate, acrylic resin, epoxy, urethane and styrene.
- [c19] 19. A flash device, comprising:
 a housing having an opening;

an LED array positioned in said housing, said LED array including a plurality of light emitting diodes; and

a light collector positioned in front of said LED array within said housing, said light collector including a transparent main body having a first portion and a second portion opposite to each other, said first portion facing to the opening of said housing and said second portion facing to said LED array, said first portion having at least one first semi-cylinder and said second portion having a plurality of second semi-cylinders, said first semi-cylinders being perpendicular to said second semi-cylinders;

wherein the number and the respective geometric arrangement of said first semi-cylinders and said second semi-cylinders are determined according to the LED array and said light emitting diodes correspond to said second semi-cylinders in a one-to-one basis.

- [c20] 20. The flash device of claim 19, wherein the curvatures of said first semi-cylinder and said second semi-cylinder are selected from a group consisting of spherical curvature and non-spherical curvature.